

PROCEEDINGS
OF THE
BIOLOGICAL SOCIETY OF WASHINGTON

NEW AND INTERESTING AMERICAN GRASSES.

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The following miscellaneous descriptions and notes are part of the results of studies incidental to general systematic work upon American grasses during the past year. They are published at the present time principally because the projected monographs of several of the genera have been discontinued by the writer. The types of all the new species are in the National Herbarium.

***Epicampes leptoura* sp. nov.**

Habit of *E. rigens* Benth. Culms rather stout, about a meter high, terete, scabrous, three-jointed. Sheaths smooth, longer than the internodes; ligule membranous, obtuse or retuse, 2-3 mm. long; blades very narrow, strongly involute, harshly scabrous, the lower ones 30 to 40 cm., the uppermost about 10 cm. long. Panicle spike-like, erect, narrow, pale, densely flowered, sometimes interrupted below, 10 to 25 cm. long, 5 to 6 mm. thick; rays closely appressed, the longest 1 cm. long. Empty glumes lanceolate, scabrous on the keels, exceeding the floret, the lower 4 mm. long with an awn 1 mm. long, the upper 3.5 mm. long with a flexuous awn of equal length; flowering glume minutely scabrous, 2 to 2.5 mm. long, ovate, truncate, three-nerved, bearing a very short awn from the back near the apex; palea as long or slightly longer, the two nerves meeting at the acute apex. Related to *E. rigens* Benth, but easily distinguished by the awned glumes.

Collected by C. H. Townsend and C. M. Barber, in the Sierra Madre near Colonia Garcia, Chihuahua, Mexico, No. 341, September 21, 1899, altitude 7,000 feet (Type).

***Epicampes macrotis* sp. nov.**

A stout tufted grass about 1 meter high, with flat very scabrous leaves, very long firm auricles, and an erect rather loose narrow panicle. Culms terete, smooth, 80 to 100 cm. high. Leaves numerous, closely investing the base of the culm; sheaths smooth, striate, keeled, about 10 mm. broad, the margins prolonged into narrow auricles 2 to 4 cm. long; ligule very thin, scarious, laciniate; blades flat, strongly keeled, striate, retrorsely scabrous on the upper surface, margins and keel, 4 to 6 mm. wide, somewhat shorter than the culms. Panicle 30 to 35 cm. long, narrow, erect; rays irregularly fascicled, scabrous, erect, the longest 5 to 6 cm. long. Spikelets 3 to 3.5 mm. long; empty glumes obtuse, not keeled, subequal, shorter than the floret; flowering glume lanceolate, acute, three-nerved, smooth; palea obtuse, nearly as long as the flowering glume.

Collected by J. N. Rose in the Sierra Madre, Zacatecas, Mexico, No. 3528. August 7, 1897 (Type).

The species should be readily distinguished by its crowded sheaths and very long auricles.

***Epicampes crassiculmis* sp. nov.**

A very stout and tall, pale, very smooth species with rather broad folded leaves and a large purplish panicle with ascending branches. Culms 1 to 2 m. high, 1 cm. or more thick, terete, very smooth, about six-jointed, from stout rootstocks. Sheaths smooth and polished, thick and firm, sparsely hairy in the throat, the lowest 70 cm. long, shorter than the joint; ligule obsolete; blades thick and rigid, folded, smooth beneath, striate above, scabrous on the margins, 8 to 10 cm. wide, apparently about a meter long. Panicle rather dense, 30 to 45 cm. long, 4 to 6 cm. wide; rays fasciculate, verticillate, erect or ascending, somewhat scabrous, the longest 15 cm. long. Spikelets 3 mm. long; empty glumes smooth, carinate, lanceolate, acute, the upper 2 mm. long, the lower $\frac{1}{2}$ to $\frac{2}{3}$ as long; flowering glume one-nerved, acute, smooth, awnless, 2.5 to 3 mm. long; palea slightly shorter; a second rudimentary floret is often present.

Collected by Dr. E. Palmer, No. 414, in alkali soil at Alamos, Sonora, Mexico, in 1891 (Type).

***Melica montezumæ* sp. nov.**

A pale green, loosely tufted, erect perennial 50 to 60 cm. high, with loose, at length spreading panicles bearing silvery spikelets. Culms with 6 to 7 nodes, only the upper part naked, this striate scabrous. Leaves about 7, the lower 2 or 3 reduced to sheaths; sheaths striate, smooth, exceeding the internodes; ligules scarious, lacerate, adnate, 5 to 10 mm. long; blades linear, rather rigid, erect or ascending, flat or loosely involute, 10 to 20 nerved, scabrous on both sides, especially beneath, mucronate at the naviculate apex, 10 to 20 cm. long, 2 to 3 mm. wide. Panicle 10 to 18 cm. long, erect; rays smooth, in pairs or sometimes in threes, unequal, at first erect, at length divaricate or even reflexed, the longer 5 to 6 cm. long, sparingly branched and flowering above the middle, the shorter ones

flowering from the base. Spikelets 7–9 mm long, on slender pedicels which are usually abruptly curved and pubescent just at the points of attachment. Perfect floret only one; lower empty glume oblong, retuse, silvery scarious in the apical third, 7 mm. long, five-nerved, only the mid-nerve reaching the apex, the others anastomosing about the middle of the glume; upper empty glume oblong-linear, obtuse, 7 mm. long, five-nerved, the lateral ones faint; flowering glume oblong, truncate and retuse, 6 to 7 mm. long, thick and green for three-fourths its length, scarious at the apex, eleven-nerved, the nerves rugose and anastomosing near the apex of the thick part, the intermediate ones bearing a few bristles; palet spatulate-oblong, retuse, 4.5 mm. long, the nerves ciliate, the margins narrow; sterile floret clavate, pedicelled, reaching the apex of the palet.

Santa Eulalia Mountains, Chihuahua, Pringle, No. 430, April 6, 1885 (Type); Chihuahua, E. Williamson, No. 342 in 1885; Sierra Mojada Mts., Coahuila, M. E. Jones, No. 482, April 19, 1892.

Heretofore mistaken for *M. laxiflora* Cav., a much taller Chilean species which differs in having 2 to 3 perfect florets, acutish empty glumes, more hairy 7-nerved flowering glumes and very scabrous sheaths.

***Poa brachyglossa* sp. nov.**

Perennial; whole plant pale or glaucescent, the panicle often somewhat purple tinged. Culms terete, glabrous, smooth and firm, mostly 3-jointed, 60 to 100 cm. high. Sheaths smooth, glabrous, shorter than the internodes; ligules of the innovations very short, of the culm leaves 1 to 2 mm. long, scarious; blades rather stiff, acute, folded or involute, almost leathery in texture, 5 to 20 cm. long. Panicle narrow, erect or nearly so, 10 to 20 cm. long; rays in 6 to 8 obscure series of 2 to 5, short, clustered, ascending, somewhat scabrous. Spikelets oblong-linear, 7 to 10 mm. long, 3 to 6-flowered, the florets appressed. Empty glumes smooth, thin, with broad scarious margins, glabrous except the midnerve, which is scabrous above, the lower lanceolate, acute, 4 to 5 mm. long, 3-nerved, the lateral ones short, the upper ovate, 3-nerved, a little longer; flowering glume elliptic-ovate, obtusish, the sides much inrolled, smooth, or nearly so, quite firm in texture, convex, faintly nerved, the lateral nerves disappearing in the scarious apex; palet oblong-linear, obtuse, the nerves ciliate-scabrous, the lateral part half as broad as the internerve.

This is the representative of *Poa laevigata* Scribn. west of the Rocky Mountains. It is confined largely to somewhat alkaline soils, which it often covers in nearly pure growths. The short ligules separate it at once from any other species of the group, namely *laevigata*, *lucida* and *nevadensis*.

The following collections are representatives of *Poa brachyglossa*. The type has smooth leaves and culms, but other specimens included differ only in having both the culm and leaves somewhat scabrous.

Washington: Douglas County, Sandberg & Leiberg 267, June 22, 1893 (Type); Coulee City, Piper 3917, 3916, 3918; Cold Creek, Cotton 402; Without locality, Vasey 42; Wenas, Griffiths and Cotton 80; Loomis, Griffiths

and Cotton 338; Cow Creek, Griffiths and Cotton 518; Colville Reservation, Griffiths and Cotton 391; Prosser, Griffiths and Cotton; Brewster, Griffiths and Cotton 264; Endicott, Elmer 1025.

Oregon: Silver Creek, Harney County, Cusick 2614; Steen's Mountain, Griffiths and Morris 637; Beulah, Leiberg 2316; without locality, Howell 188; Hay Creek, Crook County, Leiberg 210; Prineville, Leiberg 309.

Nevada: White Horse Mts., Griffiths and Morris 442; Winnemucca, Griffiths and Morris 29, 38; Woodworth, Tracy 262; E. Humboldt Mts., Watson 1318.

California: Mt. Lola, Kennedy and Doten 182; Mountains south of Dixie Valley, Davy, July 5, 1894.

Idaho: Without locality, Henderson 3076.

***Poa pachypholis* sp. nov.**

Perennial, densely tufted, wholly glabrous below the inflorescence, 15 to 30 cm. high. Basal leaves numerous, the dead sheaths long persisting; sheaths often purplish; ligule hyaline, rather firm, acute, 2 mm. long; blades narrow, erect, very smooth, thickish, pale or glaucous, flat or loosely involute, 4 to 10 cm. long, 1 to 2 mm. wide; culm leaves usually 3, their sheaths exceeding the internodes, their blades short. Panicle dense, oblong, 2 to 5 cm. long; lower rays in twos, rarely in threes, smooth, spikelet-bearing nearly to the base. Spikelets 3 to 5 flowered, ovate, 6 to 8 mm. long, pallid, or more or less tinged with purple. Empty glumes 3.5 to 4 mm. long, subequal, ovate, acutish, smooth, thick and firm, with a narrow scarcely hyaline margin, each with three nerves, the lateral ones reaching only half way to the apex. Flowering glumes similar in texture to the empty ones, broadly oblong, obtuse, 4 mm. long, 5-nerved, the basal half of the nerves pubescent. Palet equalling the flowering glume, the nerves ciliate.

Ilwaco, Washington, on cliffs wet by the ocean spray, June 22, 1904, C. V. Piper (Type).

Among North American species this is closely allied only to *Poa alpina* L., but is at once distinguished by its narrow involute glaucous leaves and thick glumes. In aspect it resembles *Poa unilateralis* Scribn. but it has no close relation to that species.

***Poa cottoni* sp. nov.**

A densely tufted perennial, 30 to 50 cm. high, the numerous innovations bearing many filiform glaucous and very scabrous leaves surrounded at base by the old dry sheaths, and bearing rather dense ovate or oblong erect usually purple panicles, 2 to 6 cm. long, on slender nearly naked stems. Culms erect, scabrous, especially just below the inflorescence; node solitary, near the base. Basal leaves very numerous, their sheaths loose, somewhat scabrous, reaching nearly to the node, persistent when dry; ligule scarious, obtuse, 1.5 to 2 mm. long; blades narrowly filiform, strongly involute, pale or glaucous, strongly scabrous, abruptly acute, 4 to 20 cm. long, $\frac{1}{4}$ to $\frac{1}{2}$ the length of the culm; sheath of the culm leaf extending

half way to the panicle, its short blade 1 to 3 cm. long. Panicle ovate or oblong, quite dense, 2 to 6 cm. long; rays short, scabrous, 2 to 4 at a node, bearing one to five spikelets at or near their tips, the lower rays branched in the larger panicles. Spikelets compressed, oblong-ovate, 3 to 5 or rarely 7-flowered, 6 to 10 mm. long; rachilla scabrous; florets closely imbricated; glumes firm, dull, hyaline margined; first empty glume 1-nerved, broadly ovate, hardly acute, scabrous on the keel above, sparingly ciliate near the apex, 3 mm. long; second similar, 3-nerved, 4 mm. long; flowering glumes ovate, barely acute, 5-nerved or rarely 6-7-nerved, very sparsely scaberulous, scabrous on the keel, minutely ciliate near the apex, 4.5 to 5 mm. long; palea equalling or exceeding the glume, oblong-lanceolate, retuse, the nerves strongly ciliate, the lateral portions half as wide as the internerve.

Related to *Poa cusickii* and *Poa idahoensis*, differing from the former in its strongly involute narrower leaves, denser panicles, scabrous stems, and larger florets; from the latter in its smaller size, dense panicles, and close spikelets, and from both in its much wider glumes and usually purple panicles.

The following specimens have been examined:

Washington: Rattlesnake Mountains, Yakima County, Cotton 557, May 7, 1902 (Type); same locality, Griffiths and Cotton Nos. 4 and 20; Kahlotus, Cotton 1010.

Oregon: Grizzly Butte, Crook County, Leiberg 231; Calamity to Silvies Valley, Griffiths and Morris 814; Silver Creek Valley, Cusick 2613; Island Ranch, Griffiths and Morris 724.

***Poa sandbergii* Vasey.**

A study of the types of *Festuca spaniantha* Phil., Anal. Univ. Chile 94: 174. 1896, and *Festuca patagonica* Phil., Anal. Univ. Chile 94: 174. 1896, in Philippi's herbarium show them to be identical with *Poa sandbergii* Vasey of the Columbia Basin. The recurrence of this species in the southern hemisphere is a fact as yet unparalleled among the western Poas.

***Distichlis multinervosa* (Vasey). comb. nov.**

Melica multinervosa Vasey, Bot. Gaz. 16: 235, 1891.

This grass is closely related to *D. texana* (Vasey) Scribn. and it is not congeneric with *Melica*. No other specimens seem to have been collected since the plant was found by Mr. G. C. Nealley at Brazos Santiago, Texas.

***Bromus vestitus* Schrad.**

Bromus vestitus Schrad. Gött. Gel. Anz. 3: 2074, 1821.

This grass has not previously been recorded from this country, but it appears to be quite widely established in California. The following specimens have been seen: Bakersfield, Kern County, Davy 1746; Pilarcitos, San Mateo County, Davy 1146; Yosemite Valley, Bioletti 15, in May, 1900.

***Bromus marginatus maritimus* subsp. nov.**

Culms coarse, 60 to 90 cm.; leaf-blades glabrous, 5 to 10 cm. broad; panicle narrow, compact, 10 to 15 cm. long, the spikelets densely crowded.

A characteristic subspecies from the sea coast of California. The scanty herbarium material has heretofore been considered as abnormal, but a splendid series of specimens collected by Mr. J. B. Davy shows that its peculiarly dense panicle is a constant character.

The following specimens have been examined, all from California: Point Reyes, Davy 6798 (Type): 6744: 6760; Monterey, Davy 7281; Ocean Beach, Lemmon; San Francisco County, Michener and Bioletti, June 22, 1892; without locality, Lemmon 383, in 1882; Ocean Bluffs near San Francisco, Piper 6824.

***Bromus tectorum nudus* Klett and Richter.**

Bromus tectorum nudus K. and R. Fl. Leipzig 109, 1830.

This variety is distinguished from true *Bromus tectorum* L. by having smooth or merely scabrous flowering glumes. It has become established in several western states as indicated by the following specimens: Uinta County, Wyoming, A. Nelson 7215; Klamath County, Oregon, Cusick 2844; Columbia Falls, Montana, Blankenship 36.

***Hordeum comosum* Presl.**

Hordeum comosum Presl. Rel. Haenk. 1:327, 1830.

The following specimens seem referable to this Chilean grass: Alma, Wash., Elmer 535, June, 1897; Colville Reservation, Wash., Griffiths and Cotton 363, June, 1902. The latter specimen is an excellent match for the specimen in Philippi's herbarium of Chilean grasses. The species is very close to *H. caespitosum* Scribn., differing only in having pubescent sheaths and blades.

***Agropyron griffithsi* Scribn. & Smith in herb.**

A pale, loosely tufted grass, 30 to 80 cm. high, having stout and elongate reeping rootstocks. Culms 2-jointed, cylindrical, slightly striate, glabrous. Sheaths striate, glabrous or glaucous or puberulent; ligule obsolete or nearly so; blades rather rigid, strongly striate, mostly involute, smooth beneath, scabrous above, 5 to 12 cm. long. Spike erect, 8 to 15 cm. long, rather close; joints of the rachis flattened, very scabrous on the angles, usually about half as long as the spikelets. Spikelets pale, oblong, subterete appressed, usually half-overlapping, closely 5 to 7 flowered; joints of the rachilla clavate, scabrous on the angles, 1 to 1.5 mm. long. Lower glume linear-lanceolate, 3-nerved, 8 mm. long, tipped with an awn 3 mm. long, scabrous on the nerves; upper very similar, but broader and 4 to 5-nerved. Flowering glume oblong, firm, somewhat flattened on the back, smooth and nerveless below, 5-nerved and scabrous apically, 8 to 10 mm. long, tipped

with a stout divergent scabrous awn of equal length; palet oblong-linear, obtuse, shorter than the body of the flowering glume, the nerves strongly scabrous ciliate, the sides less than one-half as broad as the internerve.

Type specimen collected by Williams and Griffiths, No. 140, on the North Fork of Clear Creek, Wyoming, altitude 2,600 meters. Other specimens are referred here as follows:

Wyoming: Near Beulah, Griffiths 412; Inyan Kara, Griffiths 641.

North Dakota: Dickinson, M. A. Brannon 123; Broncho, L. R. Waldron 2232.

The species is near *A. albicans* Scribn. & Smith, but is readily separable by its nearly smooth flowering glume.

Agropyron sitanioides J. G. Smith sp. nov.

"Culms erect or ascending, 20 to 30 cm. high, their bases clothed with tumid leaf sheaths; innovations $\frac{1}{2}$ to $\frac{2}{3}$ the length of the culm, stout, rigid, internodes terete, glabrous. Sheaths closely enveloping the internodes scarious along the margins, glabrous; ligule obsolete, blades rigid, erect, involute, filiform, sharply-pointed, scabrous on the back, strongly nerved and scabrous above and on the margins. Spike rigid, erect, long-exserted, 5 to 8 cm. long. Spikelets strict, erect, few-flowered. Internodes of the rachilla 1 mm. long, hispid. Empty glumes subulate, entire or bifid, 2-nerved, very scabrous along the nerves, with a stout, scabrous, ascending awn 3 to 4 cm. long; flowering glumes coriaceous, lanceolate, appanate on the back, 8 to 9 mm. long, nearly 2 mm. wide, scabrous, with a stout, ascending or spreading awn about 5 cm. long arising from between two short teeth; palet shorter than the flowering glume, obtuse, callus hispid. Internodes of the rachis compressed, scabrous along the margins, somewhat dilated above, about 4 to 5 mm. long.

"Type collected by David Griffiths, No. 735, Rapid City, South Dakota, August 28, 1897. Growing on dry knolls.

This species is doubtfully referred to *Agropyron*. It agrees with species of *Sitanion* in having the rachis of the spike subarticulate at maturity; the empty glumes bifid, and the flowering glume trifid. It is like *Elymus* in the lanceolate empty glumes, scabrous callus of the flowering glume, and scabrous internodes of the rachilla, but the solitary spikelets and opposite empty glumes enclosing the base of the spikelet between them denote a closer generic affinity with *Agropyron*, although it is not closely related to any of the American species."

Agropyron flexuosum comb. nov.

Sitanion flexuosum Piper, Erythea 7:10. (1899).

Repeated field observations of this species since its publication, together with the careful study of a large series of specimens, demonstrate that it must be considered a close relative of *Agropyron spicatum* (Pursh). It is not at all uncommon to find the spikelets at some of the nodes of the rachis in this last-species, for instance in Cusick's No. 1914, from eastern

Oregon; in Flett's No. 1383, from Skamania Co., Wash.; and in Piper's No. 3953 from Wawawai, Wash. This, of course, is an approach toward *Elymus*. In the plant described as *Sitanion flexuosum*, not only are there two spikelets at one or more joints of the rachis, but many of the empty glumes, even where there is but a single spikelet, are long-awned and more or less deeply bifid or trifid. The flowering glume has its apex more pronouncedly bifid than in the typical form, and the teeth usually bear small awns. Apart from these characters the spikelets are exactly those of *A. spicatum*. The spike tends to be flexuous and nodding, but exactly this same thing occurs in neighboring plants which otherwise are clearly referable to *A. spicatum*.

***Elymus mollis* Trin.**

Elymus capitatus Scribn., U. S. Dept. Agr. Div. Agrost. Bull. 11 : 55, 1898.

The supposed species *E. capitatus* is merely a form of *E. mollis* Trin. modified by the attacks of nematode worms in the ovaries. This form is confined almost entirely to sand dunes, in which localities from fifty to ninety per cent. of the plants have the heads thus affected. The attacks of these microscopic worms in *E. mollis* result in the heads becoming much shorter and broader, so as to vary from subglobose to oblong, while the spikelets become somewhat proliferous, all the parts being abnormally elongated and less hairy. It is not uncommon to find both normal and affected heads on the same plant, the contrast in their forms being striking. *Elymus mollis* is abundant all along the Alaskan coast, while the *capitatus* form is plentiful on the sand dunes near Yakutat and on Cook Inlet near Homer and near Kenai.